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the protoplasm. He first makes a study of the antagonism of $AlCl_3$ to $CuSO_4$. For this study he uses the hypocotyls of *Cucurbita Pepo*, which are placed in the solution to be tested for a given time, removed, rinsed with distilled water, and dried with filter paper, then placed in a horizontal position in saturated air, and after 24 hours examined for geotropic response. The length of exposure at a standard temperature in a given solution that nulls geotropic reaction in 70 per cent of the hypocotyls is termed the life-duration for the solution. In 0.025 *n* $CuSO_4$, the life-duration is less than 40 minutes; but if the solution also contains 0.15 *n* $AlCl_3$, the life-duration is 4 hours. In this concentration of $CuSO_4$ higher or lower concentrations of $AlCl_3$ give shorter life-durations. In 0.005625 *n* $CuSO_4$ the life-duration is about one hour, but if $AlCl_3$ is present in 0.025 *n* concentration, the life-duration is 22 hours; and if in 0.07 *n* concentration, 26 hours. The author shows that in a given $CuSO_4$ solution for a given time far less copper enters the hypocotyl when $AlCl_3$ is present, but it is to be regretted that his determinations of copper were not quantitative. It is maintained that the slower entrance of the copper salt in the presence of $AlCl_3$ is due to a lowering of the permeability of the plasma, as such, to the former, and not to the other possibility of lowered toxicity, for concentrations of $AlCl_3$ that are themselves quite injurious to the cells lower markedly the rate of entrance of $CuSO_4$. Potassium nitrate showed some antagonism against the toxicity of quinine hydrogen chloride and methyl violet to *Spirogyra*. The nitrate of calcium was much more effective in this respect, and it in turn was greatly excelled by the nitrate of aluminium. In these cases also antagonistic action seems to be due to reduced permeability. Inorganic salts are not constantly antagonistic to the toxic action of piperidine on *Spirogyra;* while some increase the toxicity, others lower it. The effect in these cases is a function of both the kation and the anion, although the kations are predominant in their influence. Slight traces of alkaloids and basic dyes in the protoplasm render it more subject to deformation by the salts used, whether the latter act antagonistically or not.—WM. CROCKER.

Wild wheat in Palestine.—The discovery of wild wheat in Palestine by AARONSOHN has attracted a great deal of attention, chiefly because of the possible practical importance of a hardy race of wheat. This Palestinian wheat has now been under observation and culture for three or four years, and the general results have been summarized by COOK[19] in a bulletin of the Bureau of Plant Industry. The whole bulletin is of interest, but only certain general conclusions can be selected for mention.

The wild wheat was discovered on Mount Hermon, but later it was found growing under very different conditions in the Jordan Valley, and probably has a much wider range. It is especially abundant on limestone formations, being absent or very scantily represented on volcanic intrusions. It is exceedingly variable in pollination methods, being not only adjusted for cross-pollination by the extrusion of the stamens, but in some cases being protogynous or protandrous. Occasionally it is adjusted for self-pollination, like the domesticated wheats. It is thought that the remarkable individual diversity shown by this wild wheat is explained by the great freedom in adjustments for pollination. It is further concluded that the self-pollination of the domesticated races is not a primitive condition, but that the adjustments for cross-pollination have been lost, and as a consequence there has been a decline in vigor, fertility, and disease-resistance.

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[19] COOK, O. F., Wild wheat in Palestine. Bull. 274, Bur. Pl. Ind., U.S. Depart. Agric. pp. 56. *figs. 11. pls. 15.* 1913.

The joints of the rachis are peculiar in separating from one another at maturity, each joint remaining attached to its spikelet and forming a barbed beak. It was observed that these beaked spikelets "creep into crevices of rocks or bury themselves in the soil."

There seems to be no reason to doubt that this Palestinian plant is a genuine wild wheat, but it is by no means certain that it is the prototype of our domesticated races. In fact, it is suggested that it be named as a distinct species (*Triticum hermonis*, from Mount Hermon). Of course, whether it is the prototype of our domesticated races or not is not a question that affects its practical value.

T. hermonis is a hardy plant in the sense of being able to live under a wide range of natural conditions, and it suggests the possibility of obtaining from it races of wheat adapted to the arid regions of the southwestern states. There is also a possibility of breeding its rust-resistance into our domesticated races. It is even suggested that this wild wheat may be used as a self-sown forage plant on the grazing lands of the Southwest; but the caution is urged that it might become a troublesome weed!—J. M. C.

Biologic species of Rhytisma.—The widespread occurrence of *Rhytisma acerinum* on many species of maple has led MÜLLER[20] to investigate the host relationships of this form whose distribution seems to indicate that it includes several biologic species. The field observations which led to this view were fully confirmed by cultural experiments which showed that the forms usually included in *Rhytisma acerinum* can be separated into at least two biologic species. The name *R. acerinum* is retained for one of these, the other is described as *R. pseudoplatani*.

Under *R. acerinum* two minor forms are distinguished according to the ease with which they infect different species of maple. *R. acerinum* f. *platanoides* occurs principally on *Acer platanoides* and infects less easily *A. pseudoplatanus* and *A. campestris*. *R. acerinum* f. *campestris* occurs principally

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[20] MÜLLER, K., Zur Biologie der Schwarzfleckenkrankheit der Ahornbäume, hervorgerufen durch den Pilz *Rhytisma acerinum*. Centralbl. Bakt. II. **36**:67–98. *figs. 4. pls. 4.* 1912. Preliminary account, Ber. Deutsch. Bot. Gesells. **30**:385. 1912.